

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P04704100</b>		<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/JP2004/000488</b>	International filing date (day/month/year) <b>21.01.2004</b>	Priority date (day/month/year) <b>21.01.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>C01F 5/22, 5/14, C08K 3/22, 3/34, C08L 101/00, C23C 26/00</b>			
Applicant <b>YAZAKI CORPORATION</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>11</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>3</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/000488

**Box No. I**      **Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-15 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 2, 3, 15, 21, 23, 24, 26, 29, 30, 36-43 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1, 5-7, 11-14, 16, 18-20, 25, 27, 31, 32, 35 received by this Authority on 19-11-2004
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/3-3/3 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 4, 8-10, 17, 22, 28, 33, 34 \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. IV

Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted the claims nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
  - ☒ not complied with for the following reasons:

See supplemental sheet

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos. \_\_\_\_\_

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/000488

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-3, 5-7, 11-16, 18-21, 23-27, 29-31, 35-39	YES
	Claims	32, 40-43	NO
Inventive step (IS)	Claims		YES
	Claims	1-3, 5-7, 11-16, 18-21, 23-27, 29-32, 35-43	NO
Industrial applicability (IA)	Claims	1-3, 5-7, 11-16, 18-21, 23-27, 29-32, 35-43	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
Document 1:	JP 8-259224 A (Sumitomo Chemical Co., Ltd.), 8 October 1996		
Document 2:	JP 1-320219 A (The Nippon Chemical Industrial Co., Ltd.), 26 December 1989		
Document 3:	JP 53-142454 A (Asahi Chemical Industry Co., Ltd.), 12 December 1978		
Document 4:	JP 2001-151952 A (Fujikura Ltd.), 5 June 2001		
Document 5:	JP 2001-310977 A (Dow Corning Toray Silicone Co., Ltd.), 6 November 2001		
Document 6:	JP 2-279515 A (Naikai Engyo Kabushiki Kaisha), 15 November 1990		
Document 7:	JP 7-61812 A (Tateho Kagaku Kogyo Kabushiki Kaisha), 7 March 1995		
1) Claims 1-3, 5-7, 27, 29-31, 42 and 43			
<p>As mentioned in documents 1, 6 and 7, reacting magnesium salt with a metal hydroxide to produce magnesium hydroxide is a well-known reaction. In each of documents 1, 6 and 7, the reaction temperature is in the range of 10-100°C and the average particle size of the magnesium hydroxide is understood to be within the range</p>			

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

of 10nm-10 $\mu$ m. Moreover, with respect to claims 31, 42 and 43, documents 1, 6 and 7 indicate that the magnesium hydroxide obtained through this procedure is used as a flame-retardant for resins and document 1 indicates that it can be applied to wiring and low density polyethylene is already known as a resin used in such an application (documents 4 and 5).

Furthermore, document 3 discloses the feature of surface-treating magnesium hydroxide used as a flame-retardant with a reactive silicone. Consequently, when using the magnesium hydroxide disclosed in documents 1, 6 and 7 as a flame-retardant, it would be easy for a person skilled in the art to conceive of surface-treating with silicone, as described in document 3. The feature of performing the surface-treatment at the same time as the production of magnesium hydroxide and the feature of determining the appropriate amount of surface-treatment material are both matters of design to a person skilled in the art. Therefore, claims 1-3, 5-7, 27, 29-31, 42 and 43 do not involve an inventive step.

2) Claims 11-16, 18-20, 27, 29-31, 42, 43

Document 2 discloses particles of magnesium hydroxide, the surface of which is coated with silica. The size of said particles appears to be equivalent to the size stipulated in claim 16 and, therefore, these particles are essentially identical to the magnesium hydroxide/silica composite particles set forth in claims 11-16 and 18-20 with the exception of the surface-treatment (furthermore, the inventions set forth in claims 11-16 and 18-20 define the aforementioned

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

composite particles via the production method thereof, but the magnesium hydroxide/silica composite particles per se prior to the surface treatment cannot be distinguished from the particles in document 2). Document 2 also indicates that the aforementioned particles are used as a flame retardant for a resin used to coat wiring. As indicated in point 1) above, it would be easy for a person skilled in the art to conceive of performing surface-treatment using silicone based on the disclosures in document 3. The feature of performing the surface-treatment at the same time as the production of magnesium hydroxide and the feature of determining the appropriate amount of surface-treatment material are both matters of design to a person skilled in the art. Therefore, claims 11-16, 18-20, 27, 29-31, 42 and 43 do not involve an inventive step.

3) Claims 21 and 23-26

Document 2 discloses the feature of adding sodium hydroxide to an aqueous solution of magnesium chloride, hydrothermally treating, and dispersing the obtained magnesium hydroxide in water so as to produce the starting material for the composite particles and discloses, as one of the methods for producing the magnesium hydroxide/silica composite particles, a method wherein acid is added to an aqueous solution of sodium silicate and the neutralised solution is added to a magnesium hydroxide dispersion.

Consequently, document 2 suggests the feature of mixing and composing magnesium hydroxide and silica as a method for producing magnesium hydroxide/silica composite particles and a person skilled in the art would be able

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

to determine the manner of mixing, such as whether the elements are mechanically mixed or whether they are mixed in a slurry form using a solvent.

In addition, in document 1, a magnesium salt and a metal hydroxide are reacted in the presence of a substance containing silicon, with the aim of producing magnesium hydroxide containing a silicon component. Taking this into account, it would be easy for a person skilled in the art to conceive of not only mixing in the silica after the synthesis of the magnesium hydroxide, but also of adding the silica at the time of the synthesis of the magnesium hydroxide, as a method to obtain composite particles.

Therefore, claims 21 and 23-26 do not involve an inventive step.

4) Claims 32, 35, 37-43

Document 4 discloses a flame-retardant resin composition used to cover wiring, which comprises a polyolefin resin, silica particles and magnesium hydroxide particles that have been surface coated with a stearic acid and a low density polyethylene is given as an example of a polyolefin resin.

In addition, the content of said magnesium hydroxide and silica falls within the range indicated in claims 40 and 41. Therefore, claims 32 and 40-43 lack novelty.

Furthermore, the use of a dry silica (for example, see document 5) or one treated with a methyl group as the silica in question and the feature of setting the amount of surface-treatment agent used at approximately 1-2 wt.% are known and can be achieved by a person skilled in the art. Hence, claims 35 and 37-39 do not involve an

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

inventive step.

5) Claim 36

As discussed in Box VIII with respect to claim 36, it is unclear whether the surface-treatment using silicone and the surface-treatment using stearic acid both occur. However, the claims, description and drawings of the application as initially filed do not disclose the feature wherein the surface-treatment using silicone and the surface-treatment using stearic acid both occur. Therefore, the invention set forth in claim 36 is judged to be a magnesium hydroxide synthesised by a reaction between a magnesium salt and a metal hydroxide, wherein said magnesium hydroxide is surface-treated with stearic acid.

As discussed in point 1) above, the above-mentioned reaction is well-known as a method for producing magnesium hydroxide. Therefore, it would be easy for a person skilled in the art to conceive of producing the magnesium hydroxide disclosed in document 4 using such a reaction.

Consequently, claim 36 does not involve an inventive step.



**Box No. VIII** Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- 1) Claims 1, 2 and 11-15 define magnesium hydroxide or magnesium hydroxide/silica composite particles through a method of production, but it is unclear what kind of particles (for example, the structure and size thereof) they are.
- 2) Although claim 36 contains the wording "the magnesium hydroxide particles are any of those set forth in claims 1-7", this claim recites claim 32. The magnesium hydroxide set forth in claims 1-7 is synthesised through a reaction between a magnesium salt and a metal hydroxide and then surface-treated with silicone. However, the magnesium hydroxide in claim 32 is surface-treated with stearic acid. Hence, it is not clear whether the magnesium hydroxide in claim 36 is surface-treated with both silicone and stearic acid or not, or whether claim 36 merely recites the part of claim 1 that reads "synthesised through a reaction between a magnesium salt and a metal hydroxide and the magnesium hydroxide produced through said synthesis is surface-treated using stearic acid."

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

## IV. 3.

The inventions set forth in claims 1-3 and 5-7 pertain to magnesium hydroxide that has been surface-treated using silicone; the inventions set forth in claims 11-16 and 18-20 pertain to composite particles of magnesium hydroxide and silica that have been surface-treated using silicone; the inventions set forth in claims 23-26 pertain to a method for producing composite particles of magnesium hydroxide and silica; the inventions set forth in claims 27, 29 and 30 pertain to a method for surface-treating magnesium hydroxide or composite particles of magnesium hydroxide and silica using silicone; the invention set forth in claim 31 pertains to a composition comprising a resin and magnesium hydroxide or composite particles of magnesium hydroxide and silica which have been surface-treated using silicone; the inventions set forth in claim 32, 35-41 pertain to a composition comprising a resin, silica particles and magnesium hydroxide particles surface-treated using stearic acid; the invention set forth in claim 42 pertains to the composition as set forth in claims 31 or 32 wherein the resin is a low density polyethylene; and the invention set forth in claim 43 pertains to wiring provided with a sheath layer comprising the resin composition as set forth in claim 31 or 32. Moreover, the feature of surface-treating magnesium hydroxide with silicone in the inventions set forth in these claims *per se* is known (JP 53-142454 A). Therefore, the groups of inventions (1) claims 1-3 and 5-7, (2) claims 11-16 and 18-20, (3) claims 23-26 and (4)

**Supplemental Box**

claims 32 and 35-41 all have different technical features and these groups of inventions are not considered to be so linked as to form a single general inventive concept.